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ABSTRACT

Cooperation among students in classroom problem-solving activities is briefly discussed in terms of Piaget and cooperative problem-solving, guidelines for teachers, and the teacher's role. While research results are not unambiguous, teachers can encourage children to interact and share their perspectives during cooperative play by: (1) planning activities in which children have a shared goal; (2) ensuring that the goal is intrinsically interesting; (3) making it possible for children to achieve their goals through their own actions; and (4) seeing to it that the results of the child's actions are visible and immediate. To avoid giving directions, teachers can encourage children to interact with each other, help children clarify or adapt their shared goals, and involve children who are unlikely to initiate interaction. It is concluded that cooperative problem-solving becomes a valuable part of the curriculum when teachers present problems that children at different developmental levels can work on together, encourage children's efforts to share perspectives, and help them achieve a common objective. Nine references are cited for further reading on the topic. (RH)

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Cooperative Problem-Solving in the Classroom

Jonathan Tudge and David Caruso

Over the years, early childhood education has stressed the importance of cooperative play and learning for the young child's development (Dewey, 1897). Cooperative learning involves children in the active exchange of ideas rather than passive learning. Research has demonstrated the potential of cooperative problem-solving for enhancing young children's cognitive development and learning.

Cooperative problem-solving is likely to be effective if children share a goal, and have differing perspectives on the best way of attaining it. This sharing of differing points of view in the attempt to achieve a common goal results in cognitive advance. Cooperative problem-solving often occurs in classrooms—for example, when two children attempt to ride on a swing at the same time.

Piaget and Cooperative Problem-Solving

Research on the effects of collaboration between peers on cognitive development has primarily been based on Piaget's theory concerning the impact of social interaction on cognitive and moral development (Piaget, 1932, 1959). Piaget maintained that opportunities for becoming less egocentric are more common when children discuss things with each other because then they must face the fact that not everyone has the same perspective on a situation. Psychologists have based most of their research in this area on Piaget's theory, and have examined children's performance on conservation tasks, working in pairs and individually. Several researchers have found that children who were paired with a more advanced child were later able to solve conservation tasks at a higher level, while children who worked individually did not improve.

Piagetian scholars argue that cognitive conflict—a difference in perspective that leads to discussion of each partner's opinion—is necessary for development. In trying to resolve conflicts, partners have to explain to each other their points of view. In the course of the explanation, the less advanced child can be led to greater understanding.

Study results (Tudge, 1985, 1986) suggest that in the absence of feedback, cognitive conflict (brought about by pairing children with different perspectives) only helps children who reason at a less advanced level than their partner when the partner is confident of his or her opinions. But in a third study (Tudge, 1987), in which children discovered whether or not their views were correct, children improved regardless of whether their partner initially reasoned at a less or a more advanced level. Thus our research indicates that the effects of cooperative problem-solving are by no means straightforward. We can merely suggest possible consequences of encouraging collaboration in the classroom.

Guidelines for Teachers

Teachers can encourage children to interact and share their perspectives during cooperative play by:

Planning activities in which children have a shared goal.
It is not enough to have children working side by side on an activity. For example, when two children are playing with building blocks together but working on different parts of a structure, they may not be trying to accomplish the same goal. Children who try to achieve a shared objective will find it helpful to discuss their ideas about the problem and agree on a strategy. Teachers can promote real cooperative activity by encouraging collaboration during the activity-planning stage.

Ensuring that the goal is intrinsically interesting.
Young children are likely to pursue a goal only if they find it interesting. Quite often, when teachers present problems that they see as important, they inadvertently fail to consider the children's degree of interest in solving the problem. One effective approach for maximizing the child's intrinsic interest is to involve children in activities in which they can determine their own objectives, that is, activities with several possible goals or which offer several ways of reaching the goals.

Making it possible for children to achieve their goal through their own actions.
This guideline, suggested by Kamii and DeVries (1978) for physical knowledge activities, can lead to successful cooperative problem-solving. Through acting on objects and observing the effects, young children receive feed-

PS 018803

back, which helps them adapt their differing perspectives when working cooperatively. Rolling a ball down a ramp to hit a target, for example, provides many opportunities for adapting the actions involved. Children can vary the speed and direction of the ball, the slope of the ramp, and so forth. They can discuss why they miss the target and the best way to solve the problem.

Seeing to it that the results of the child's actions are visible and immediate.
The give and take of sharing perspectives and strategies during cooperative activity will be encouraged by immediate feedback about the results of children's actions. As Kamii and DeVries (1978) point out, when children see results, they are likely to be motivated to keep trying different strategies. Contrast an activity such as planting seeds, which results in a long-delayed reaction, with a game of target-ball, in which the child chooses the objective, produces the object's action, and observes an immediate result.

The Teacher's Role in Cooperative Problem-Solving

Because the objective of cooperative problem-solving is for children to share perspectives as they pursue goals, it is essential that teachers encourage and suggest rather than give directions. These guidelines will help teachers in this effort:

1. *Encourage children to interact with each other.*
A teacher might introduce an activity in an open-ended way by saying, "Here's an activity for 2 or 3 children. What do you think we could do with these things, Brett and Sally?" This conveys the importance of each child's perspective and encourages children to come up with their own goals.

2. *Help children clarify or adapt their shared goals.*
In order for children to pursue goals cooperatively, they must agree upon a clearly delineated goal. During early childhood, when children often act first and discuss later, a teacher can play a vital role by helping them clarify their goal before they attempt to solve the problem. Teachers can verbalize the objective for the children. A teacher might say, for example, "I see. You're trying to get this water over there by using the tubes and funnels."

3. *Involve children who are unlikely to initiate.*
Quieter children are less likely than more assertive children to become involved or state their ideas. It is critical for teachers to encourage these children to participate and to help them state their perspectives on the problem.

Teaching strategies that may be appropriate for other activities limit the effectiveness of cooperative problem-solving. Even if children are struggling, it is not appropriate to demonstrate solutions or solve a problem for them. Research suggests that arriving at the correct answer is less important for children's cognitive development than the process of struggling with the problem cooperatively.

Conclusion

As Damon (1984) points out, when children explore new possibilities jointly, their thinking is not constrained by an expert who "knows better," but rather is limited only by the boundaries of their mutual imaginations. When teachers present problems that children at differing developmental levels can work on together, encourage children's efforts to share perspectives, and help children arrive at a common objective, cooperative problem-solving becomes a valuable part of the curriculum.

This digest was adapted by Sue Ann Kendall from "Cooperative Problem Solving in the Classroom: Enhancing Young Children's Cognitive Development," *Young Children*, November, 1988, pp. 46-52.

For More Information

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